

REMARKS

Claims 1, 2, 4-8 and 10-14 are pending in this application. By this Amendment, claims 1 and 5 are amended. Claims 1 and 5 are amended for clarity. Support for the amendments to the claims may be found, for example, in the specification at page 5 line 32 to page 6 line 27. No new matter is added.

Entry of the amendments is proper under 37 CFR §1.116 because the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (as the amendments amplify issues previously discussed throughout prosecution); (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

In view of the following remarks, reconsideration and allowance are respectfully requested.

I. Interview

The courtesies extended to Applicants' representative by Examiner Wartalowicz at the interview held December 31, 2008, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below and constitute Applicants' record of the interview.

II. Rejection under 35 U.S.C. §112

The Office Action rejects claims 1, 2, 4, and 5 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Office Action requests Applicant to point to the recitation in the specification that lends support to the

limitation "alkoxide or an acetate-metal complex." Applicant respectfully submits that the specification at page 5 line 32 to page 6 line 27 supports such a feature. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Rejections Under 35 U.S.C. §103

The Office Action rejects claims 1, 2, 4-6, 13 and 14 under 35 U.S.C. §103(a) over U.S. Patent No. 5,863,850 to Nawa et al. (hereinafter "Nawa") in view of U.S. Patent No. 5,023,071 to Sherif (hereinafter "Sherif") and further in view of U.S. Patent No. 5,670,088 to Chittofrati et al. (hereinafter "Chittofrati"); rejects claims 7, 8, and 10-12 under 35 U.S.C. §103(a) over Nawa in view of Sherif further in view of Chittofrati and further in view of U.S. Patent Application Publication No. 2002/0061816 to Uenishi et al. (hereinafter "Uenishi"). Applicant respectfully traverses the rejections.

Claim 1 recites in-part (emphasis added):

...contacting an organic phase having dissolved therein an organic compound of a metal alkoxide or an acetate-metal complex, the metal of said metal alkoxide or acetate-metal complex being hereinafter referred to as a first element, with an aqueous phase containing a second element as an ion, in a form of a microemulsion containing a surfactant, in which a hydroxide of said first element is produced by a hydrolysis reaction of said organic compound at the interface between said organic and aqueous phases while incorporating said second element in the product...

The applied references disclose no such combination of features or establish any reason or rationale to provide such a combination of features. Claim 6 recites similar features and is patentable for similar reasons as discussed in connection with claim 1.

Nawa discloses that an aqueous solution including zirconium and cerium salts is mixed with an organic solution of an alkoxide of titanium to obtain a mixed solution, which is hydrolyzed by adding an aqueous alkali solution thereto, to thereby generate a precipitate (partially stabilized zirconia containing CeO₂ and TiO₂). See Nawa, col. 6, lines 40-47.

However, Nawa is only a co-precipitation, and is different from the method of claims 1 and 6 in that a microemulsion is not disclosed in Nawa.

The Office Action asserts that Nawa's disclosure meets the limitation wherein a water-in-oil emulsion or microemulsion system is used due to the explanation that mixing an organic phase with an aqueous phase will necessarily result in a microemulsion. See Office Action page 5. Applicant's respectfully submit that this allegation is not only lacking support in the art, it is technically inaccurate.

For example, as explained in the specification on page 6, line 34 to page 7, line 2, forming microemulsions requires a high water/surfactant molar ratio. The Office Action acknowledges that Nawa fails to teach the aqueous phase emulsified in the organic phase with a surfactant. See Office Action, page 6. Thus, the Patent Office's allegation lacks merit, as confirmed by the fact that the Patent Office has not cited any reference describing the mixing of an organic phase with an aqueous phase will necessarily result in a microemulsion, as recited in claims 1 and 6.

Accordingly, the rejection is improper, at least because the Office Action has failed to establish a proper *prima facie* case of obviousness. To the extent the assertions in the Office Action are based on official notice, such basis is not properly established and is thus improper.

With respect to Official Notice, the MPEP states that “such rejections should be judiciously applied” (see MPEP § 2144.03). “Official notice without documentary evidence to support an [E]xaminer’s conclusion is permissible only in some circumstances” (see MPEP § 2144.03(A)). “It would not be appropriate for the [E]xaminer to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known” (see *Id.*, emphasis added).

Here, it is Applicant that has discovered that using microemulsions produces a homogenizing effect, firstly by speeding the hydrolysis rate due to the extremely small microemulsion size of from a few nanometers to ten or more nanometers and the very large oil phase/aqueous phase interface (about 8000 m²/liter with a 10 nm size) and secondly by division of the aqueous phase, which results in an extremely small number of metal ions (approximately 100) per droplet. See specification, page 9, lines 18-25. Nowhere do any of the references teach or suggest a process for production of compound oxide particles using a microemulsion containing a surfactant, in which a hydroxide of said first element is produced by a hydrolysis reaction of said organic compound at the interface between said organic and aqueous phases while incorporating said second element in the product, as recited in claims 1 and 6, and the compound oxide particles have a composition that is uniform at the atomic level (as claimed in claims 13 and 14).

The Office Action asserts Sherif and Chittofrati disclose a microemulsion. However, Sherif discloses adding water to an organic solution. This is a conventional metal alkoxide method in which water is added to a plurality of metal alkoxides and nothing more than that.

Sherif does not teach or suggest or establish any reason or rationale to modify Nawa to provide a first element in an organic solution and a second element in an aqueous phase and that reacts at an interface between the organic and aqueous phases of a microemulsion, as recited in claims 1 and 6 or to obtain a complex oxide with atom level uniformity as recited in claims 13 and 14.

Chittofrati discloses a microemulsion in which a surfactant is used, and an alkali is added thereto to form a compound metal oxide comprising metal elements that are derived from the aqueous and organic phases. However, the metal element in the organic phase forms a salt with the surfactant.

If the metal salt of a surfactant of Chittofrati, ferric perfluoroether monocarboxylate in the example, is added to an organic phase, when it contacts the aqueous phase, the salt is dissociated to release a metal ion (B ion) into the aqueous phase, and form an aqueous solution containing A ion that has originally existed prior to said contact in addition to B ion. Therefore, if an alkali is added, a compound metal oxide of A and B elements is formed. In other words, the reaction occurs in the aqueous phase, not at the interface between the aqueous and organic phases, as recited in claims 1 and 6. Alternatively, if the timing of addition of an alkali is earlier, a reaction to produce a precipitation of A element first begins, followed by incorporation of B element into the precipitate, forming a final precipitate. This final precipitate may be a core/shell-type particle. Therefore, the uniformity of the compound metal oxide obtained in Chittofrati is considered to be not different from that of a compound metal oxide that is formed by a conventional co-precipitation method in which A and B elements are co-precipitated from an aqueous solution comprising A and B ions dissolved therein.

Accordingly, Chittofrati does not cure the deficiencies of Nawa and Sherif with respect to claims 1 and 6 because Chittofrati establishes no reason or rationale to provide a microemulsion containing a surfactant, in which a hydroxide of said first element is produced by a hydrolysis reaction of said organic compound at the interface between said organic and aqueous phases while incorporating said second element in the product, as required by claims 1 and 6. Therefore, Nawa, Sherif and Chittofrati, considered either separately or combined, do not teach or suggest each and every element of claims 1 and 6 and, thus, would not have rendered obvious claims 1 and 6.

Furthermore, the combination of Nawa, Sherif and Chittofrati is based upon impermissible hindsight. At the time the invention was made, there would have been no reason or rationale for one of ordinary skill in the art to have combined Nawa, Sherif and

Chittofrati. Nawa discloses a method of producing a metal oxide by co-precipitation, but does not provide any reason or rationale to use a microemulsion or suggest that the reaction occurs at the interface. Further, Sherif does not provide any reason or rationale to utilize a microemulsion. Sherif only states that a surfactant may be used and does not state any conditions that would allow for the formation of a microemulsion (i.e., a high water/surfactant molar ratio). Chittofrati discloses a microemulsion, but the reaction occurs in the aqueous phase, not at the interface between the aqueous and organic phases. Therefore, the Office Action combines the three references solely based on Applicants' claims as a roadmap, which is clearly improper. It is Applicants' disclosure that provides and claims a process for producing a compound metal oxide with an aqueous phase containing a second element as an ion, in a form of a microemulsion containing a surfactant, in which a hydroxide of said first element is produced by a hydrolysis reaction of said organic compound at the interface between said organic and aqueous phases while incorporating said second element in the product. Therefore, the combination of Nawa, Sherif and Chittofrati is improper and, as a result, claims 1 and 6 would not have been rendered obvious by Nawa, Sherif and Chittofrati, alone or in combination.

For at least the foregoing reasons, Nawa, Sherif and Chittofrati would not have rendered obvious claims 1 and 6. Claims 2, 4, 5, 13 and 14 variously depend from claims 1 and 6 and, thus, also would not have been rendered obvious by the cited references.

Claims 7, 8, and 10-12 variously depend from either claim 1 or claim 6 and, thus, require all the limitations of either claim 1 or claim 6. Accordingly, the deficiencies of Nawa, Sherif and Chittofrati with respect to claims 1 and 6 are equally applicable to claims 7, 8, and 10-12. Uenishi fails to cure the deficiencies of Nawa, Sherif and Chittofrati with respect to claims 1 and 6. Thus, Nawa, Sherif, Chittofrati and Uenishi, considered either separately or

combined, do not teach or suggest each and every element of claims 1 and 6 and, thus, also would not have rendered obvious claims 7, 8, and 10-12.

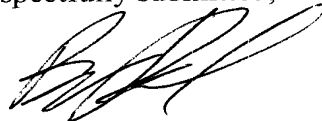
Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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